

BALANCED POWER AMPLIFIER WITH A BYPASS STRUCTURE**ABSTRACT OF THE DISCLOSURE**

[0066]

A balanced power amplifier circuit arrangement comprises a driver amplifier stage (22) adapted to receive and amplify a signal. The amplified signal is input to a first coupler (26). The first coupler (26) produces an in-phase signal and an out-of-phase quadrature signal. A first power amplifier (38) receives and amplifies the in-phase signal. A second power amplifier (40) receives and amplifies the out-of-phase signal. A first switch (28) alternately connects an isolated port of the first coupler to ground (32) or a bypass path (36). A second coupler (42) receives and combines the amplified in-phase signal and the amplified out-of-phase signal to produce a combined signal. A second switch (30) alternately connects an isolated port of the second coupler (42) to either ground (34) or the bypass path (36). When the power amplifiers (38, 40) are powered down, the first coupler (26) splits the RF-signal into an in-phase signal and an out-of-phase signal. The power amplifiers (38, 40) appear as reflective impedances to the signal when they are powered down. Each signal reflects off the first and second power amplifiers (38, 40), respectively. The first coupler (26) combines the reflected signals and routes the combined signal through the bypass path (36) to the second coupler (42). The second coupler (42) splits the signal into an in-phase and out-of-phase signal and routes each to the power amplifiers (38, 40). The power amplifiers (38, 40) reflect each signal back to the second coupler (42). The second coupler (42) combines the signals and routes the combined signal to the RF-output port. The circuit arrangement enables the integration of the balanced amplifier and first and second couplers (26, 42) into a single power amplifier package to provide low power bypassing without the need of an external circulator component.

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